Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of the claims in the application.

1. (currently amended) A system of automatically sorting objects, wherein said system comprises:

a conveyor mechanism (301) configured for conveying at least one object (308) to a sorter device (304);

a sensor device (302) arranged such that conveyed objects (308) are caused to be located essentially within a predetermined reading space (6); and

a calculator/classification unit (303) configured for receiving an electrical sensor signal (306) representing measurement data from said sensor device (302) and configured for generating and emitting a control signal (307) to said sorter device (304) configured for sorting conveyed objects (308) on the basis of said control signal (307),

characterised in

that said sensor device is based on Prompt Gamma-Neutron Activation Analysis (PGNAA) and comprises

a neutron source (2) configured for emitting neutrons;

a moderator (4) surrounding said neutron source (2) and said measurement space (6), and configured for moderating said emitted neutrons; and

a detector (8) configured for detecting gamma radiation emitted by an object (308) arranged within said measurement space (6) when the object (308) is exposed to a neutron

flux with a given energy distribution, and generation of said electrical sensor signal (306) on the basis of said detection; and

that said control signal (307) is generated on the basis of said sensor signal (306), wherein the system further comprises at least one further sensor device and wherein at least one of the at least one further sensor device is an image-forming sensor.

2. (currently amended) A system according to claim 1, characterised in that said sensor device (302) further comprises a gamma shield (3) ~~and/or a neutron shield (10)~~, wherein said gamma shield (3) is located between said source (2) and said measurement space (6) ~~and/or wherein said neutron shield (10)~~ is arranged between said detector (8) and said measurement space (6).

3. (previously presented) A system according to claim 1, characterised in that said sensor device (302) further comprises a gamma shield (5) arranged around said neutron source (2) such that direct radiation of gamma from the neutron source (2) to said detector (8) is minimised.

4. (previously presented) A system according to claim 1, characterised in that said sorting system is configured for sorting a flow of waste.

5. (previously presented) A system according to claim 1, characterised in that said detection is performed contact-free with regard to the object (308).

6. (currently amended) A system according to claim 1, characterised in that an estimate of the amount of sample material in said measurement space (6) is provided on the basis of gamma radiation of an elemental substance~~, eg hydrogen, aluminium, silicon or iron,~~ present in the sample material in a known concentration.

7. (previously presented) A system according to claim 1, characterised in that said sensor device primarily comprises carbon material as moderator.

8. (previously presented) A system according to claim 1, characterised in that the system is configured for receiving measurements of objects with a known classification; and that the classification unit (303) comprises means for calculating weight factors of a number of weighted sums established by multivariable data analysis, calibration or iterative method, by which an improved set of weight factors is successively attained by incremental refining.

9. (original) A system according to claim 8, characterised in that said control signal (307) is provided by the classification unit (303) on the basis of signals comprising said weight factors and said sensor signal (306).

10. (previously presented) A system according to claim 1, characterised in that cluster analysis is used as a step in automatic generation of suggestions for categorising sample objects on the basis of patterns in measurement data corresponding to said objects.

11. (previously presented) A system according to claim 1, characterised in that said sensor signal (306) comprises a gamma spectre representing registered gamma radiation intensity within a given photon/energy range.

12. (previously presented) A system according to claim 1, characterised in that said control signal (307) is provided on the basis of a difference between a sensor signal (306) and a predetermined reference spectre obtained with empty measurement space (6) and stored in a memory unit (403).

13. (currently amended) A method of automatically sorting objects wherein said method comprises

conveying at least one object (308) to a sorter device (304); wherein said conveyance causes conveyed objects to be essentially within a predetermined reading space (6) of a sensor device (302);

receiving an electrical sensor signal (306) representing measurement data in a calculator unit/classification unit (303) from said sensor device (302); and

generating and emitting a control signal to said sorter device (304) configured for sorting conveyed objects (308) on the basis of said control signal (307);

characterised in that the method further comprises

emitting neutrons from a neutron source (2) in said sensor device (302);

moderating said emitted neutrons by means of a moderator (4) in said sensor device (302), wherein said moderator (4) surrounds said neutron source (2) and said measurement space (6);

detecting, on the basis of Prompt Gamma-Neutron-Activation Analysis (PGNAA) by a detector (8) in said sensor device (302), gamma radiation emitted from an object (308) within said measurement space (6) when it is exposed to a neutron flux with a given energy distribution, and providing said sensor signal (306) in said sensor device (302) on the basis of said detection signal (306); ~~and~~

generating said control signal (307) on the basis of said sensor signal (306), and

sorting the at least one object (308) in the sorter device (304) based on the control signal (307)

wherein the method further comprises at least one further sensor device and wherein at least one of the at least one further sesor device is an image forming senror.

14. (currently amended) A method according to claim 13, characterised in that the method comprises minimisation of the flow of thermal neutrons into the detector by a gamma shield (3) and/or a neutron shield (10) in said sensor device (302), wherein said gamma shield (3) is located between said source (2) and said measurement space (6) and/or wherein said neutron shield (10) is arranged between ~~sad~~ said detector (8) and said measurement space (6).

15. (currently amended) A method according to claim 13, characterised in that the method further comprises minimisation of direct radiation of gamma from the neutron source (2) to said detector (8) [[of]] by a gamma shield (5) arranged around said neutron source (2) in said sensor device (302).

16. (previously presented) A method according to claim 13, characterised in that the method comprises sorting of a flow of waste.

17. (previously presented) A method according to claim 13, characterised in that said detection is performed contact-free with respect to the object (308).

18. (currently amended) A method according to claim 13, characterised in that an estimate of the amount of sample material in said measurement space (6) is provided on the basis of gamma radiation of an elemental substance~~, eg hydrogen, aluminium, silicon or iron,~~ present in the sample material in a known concentration.

19. (previously presented) A method according to claim 23, characterised in that said sensor device primarily comprises carbon material as moderator.

20. (previously presented) A method according to claim 13, characterised in that the method comprises receipt of measurements of objects of a known classification; and that the classification comprises means for calculating weight factors of a number of weighted sums established by a multivariable data analysis, calibration or an iterative method by which an incremental refining successively brings about an improved set of weight factors.

21. (original) A method according to claim 20, characterised in the method further comprises that said control signal (307) is provided by the classification unit (303) on the basis of signals comprising said weight factors and said sensor signal (306).

22. (currently amended) A method according to claim 13, characterised in that [[the]] a cluster analysis is used as a step in automatically generating suggestions for categorising sample objects on the basis of pattern in measurement data corresponding to these objects.

23. (previously presented) A method according to claim 13, characterised in that said sensor signal (306) comprises a gamma spectre representing registered gamma radiation intensity within a given photon/energy range.

24. (previously presented) A method according to claim 13, characterised in that said control signal (307) is provided on the basis of the difference between a sensor signal (306) and a predetermined reference spectre obtained with empty measurement space (6) and stored in a memory unit (403).

25. (new) A system according to claim 1, characterised in that said sensor device (302) further comprises a neutron shield (10), wherein said neutron shield (10) is arranged between said detector (8) and said measurement space (6).

26. (new) A system according to claim 1, characterised in that said sensor device (302) further comprises a gamma shield (3) and a neutron shield (10), wherein said gamma shield (3) is located between said source (2) and said measurement space (6) and wherein said neutron shield (10) is arranged between said detector (8) and said measurement space (6).

27. (new) A method according to claim 13, characterised in that the method comprises minimisation of the flow of thermal neutrons into the detector by a neutron shield (10) in said sensor device (302), wherein said neutron shield (10) is arranged between said detector (8) and said measurement space (6).

28. (new) A method according to claim 13, characterised in that the method comprises minimisation of the flow of thermal neutrons into the detector by a gamma shield (3) and a neutron shield (10) in said sensor device (302), wherein said gamma shield (3) is located between said source (2) and said measurement space (6) and wherein said neutron shield (10) is arranged between said detector (8) and said measurement space (6).